AGRICULTURAL AND RESOURCE ECONOMICS REVIEW

Modeling Unobserved Heterogeneity in New York Dairy Farms: One-Stage versus Two-Stage Models / *Antonio Alvarez, Julio del Corral, and Loren W. Tauer*

Effectiveness of Intellectual Property Protection: Survey Evidence from China / *Guanming Shi, Carl Pray, and Wenhui Zhang*

Labor Productivity Growth in the Kansas Farm Sector: A Tripartite Decomposition Using a Non-Parametric Approach / *Amin W. Mugera, Michael R. Langemeier, and Allen M. Featherstone*

The Effect of Fire Risk on the Critical Harvesting Times for Pacific Northwest Douglas-Fir When Carbon Price Is Stochastic / *Selmin F. Creamer, Alan Genz, and Keith A. Blatner*

Impact of Food Contamination on Brands: A Demand Systems Estimation of Peanut Butter / *Rafael Bakhtavoryan, Oral Capps, Jr., and Victoria Salin*

Causality Between Captive Supplies and Cash Market Prices in the U.S. Cattle Procurement Market / *In Bae Ji and Chanjin Chung*

Redistributing Agricultural Data by a Dasymetric Mapping Methodology / *Maria de Belém Costa Freitas Martins, António Manuel de Sousa Xavier, and Rui Manuel de Sousa Fragoso*

Evaluation of Crop Insurance Yield Guarantees and Producer Welfare with Upward-Trending Yields / *Shyam Adhikari, Thomas O. Knight, and Eric J. Belasco*

Revisiting the Impact of Bt Corn Adoption by U.S. Farmers / *Jorge Fernandez-Cornejo and Seth Wechsler*

Published by the Northeastern Agricultural and Resource Economics Association

Volume Number

41/3

December 2012

The *Agricultural and Resource Economics Review* (ISSN 1068-2805) (formerly the *Northeastern Journal of Agricultural and Resource Economics*, ISSN 0899-367X) is the official publication of the Northeastern Agricultural and Resource Economics Association (NAREA). The purpose of the *Review* is to foster and disseminate professional thought and literature relating to the economics of agriculture, natural resources, and community development. It is the editorial policy of the *ARER* to encourage manuscript submission without regard to author affiliation and/or location. The *ARER* is published three times a year. In addition to normal refereed articles, it also publishes invited papers presented at the annual meetings of the NAREA. It periodically calls for articles written on a specific topic. Membership in the NAREA is open to all persons having an interest in agricultural and resource economics. Membership dues include a subscription to the *Review* and are $25.00 per year for regular membership and $5.00 per year for students. The single-copy price is $15.00 per issue. The library (or institutional) subscription price is $125 per year.

Address all manuscripts and editorial material to Dr. Kent Messer at the University of Delaware. Please see inside back cover for submission instructions.

Address requests for membership, subscriptions, and changes of address to:

Dr. Douglas E. Morris
NAREA Secretary-Treasurer
Department of Natural Resources and the Environment
G68 James Hall
56 College Road
University of New Hampshire
Durham, NH 03824-2601
e-mail: dr.doug@unh.edu

Copyright © 2012 by the Northeastern Agricultural and Resource Economics Association. No article or other material appearing in the *Agricultural and Resource Economics Review* may be republished in full or in part without the written permission of the editor or the NAREA Secretary-Treasurer.

PUBLISHED BY THE NORTHEASTERN AGRICULTURAL
AND RESOURCE ECONOMICS ASSOCIATION

PRINTED BY THE SHERIDAN PRESS, INC., HANOVER, PENNSYLVANIA

AGRICULTURAL AND RESOURCE ECONOMICS REVIEW

Volume 41 / Number 3 ■ December 2012

Contents

Contributed Papers

Modeling Unobserved Heterogeneity in New York Dairy Farms: One-Stage versus Two-Stage Models / *Antonio Alvarez, Julio del Corral, and Loren W. Tauer* 275

Effectiveness of Intellectual Property Protection: Survey Evidence from China / *Guanming Shi, Carl Pray, and Wenhui Zhang* 286

Labor Productivity Growth in the Kansas Farm Sector: A Tripartite Decomposition Using a Non-Parametric Approach / *Amin W. Mugera, Michael R. Langemeier, and Allen M. Featherstone* 298

The Effect of Fire Risk on the Critical Harvesting Times for Pacific Northwest Douglas-Fir When Carbon Price Is Stochastic / *Selmin F. Creamer, Alan Genz, and Keith A. Blatner* 313

Impact of Food Contamination on Brands: A Demand Systems Estimation of Peanut Butter / *Rafael Bakhtavoryan, Oral Capps, Jr., and Victoria Salin* 327

Causality Between Captive Supplies and Cash Market Prices in the U.S. Cattle Procurement Market / *In Bae Ji and Chanjin Chung* 340

Redistributing Agricultural Data by a Dasymetric Mapping Methodology / *Maria de Belém Costa Freitas Martins, António Manuel de Sousa Xavier, and Rui Manuel de Sousa Fragoso* 351

Evaluation of Crop Insurance Yield Guarantees and Producer Welfare with Upward-Trending Yields / *Shyam Adhikari, Thomas O. Knight, and Eric J. Belasco* 367

Revisiting the Impact of Bt Corn Adoption by U.S. Farmers / *Jorge Fernandez-Cornejo and Seth Wechsler* 377

Other

NAREA Awards 391

ARER Reviewers, September 2011–August 2012 396

AGRICULTURAL AND RESOURCE ECONOMICS REVIEW

Volume 41 / Number 3 ■ December 2012

Garrick Blalock, David Just, and Kent Messer, Editors
Cornell University

Liesl Koch, Technical Editor
College Park, Maryland

EDITORIAL BOARD

Marc Bellemare, Duke University
Yanhong Jin, Rutgers University
Barrett Kirwan, University of Illinois
Travis Lybbert, University of California, Davis
Michael Roberts, North Carolina State University
Wolfram Schlenker, Columbia University

ASSOCIATION OFFICERS

PRESIDENT.....Kathleen Bell, University of Maine
PRESIDENT-ELECT.....Joshua Duke, University of Delaware
PAST PRESIDENT.....Jill Caviglia-Harris, Salisbury University
SECRETARY-TREASURER.....Douglas E. Morris, University of New Hampshire

EXECUTIVE COMMITTEE

Dana Bauer, Boston University
Director, 2010–2013
Allison Borchers, Economic Research Service, USDA
Director, 2012–2015
Carolyn Dimitri, New York University
Director, 2010–2013
Martin Heintzelman, Clarkson University
Director, 2012–2015
Ted Jaenicke, Pennsylvania State University
Director, 2011–2014
Todd Schmit, Cornell University
Director, 2011–2014
Will Wheeler, U.S. Environmental Protection Agency
Government Representative (ex-officio)

NAREA Awards

Outstanding Master's Thesis Award

Public Goods and Spatial Location: Stated Preference Prioritization with Spatial Interdependencies

Steven J. Dundas

University of Delaware
Advisor: Joshua M. Duke

Public goods exist in space and recent research has shown that accounting for the location of their provision can have policy implications. This study examines willingness to pay (WTP) for land preservation to provide a public-goods context where spatial location matters. Benefits are derived from existing survey data on parcel preservation in Delaware.[1] Easement costs are estimated with a hedonic model using data on applicant parcels to the Delaware Agricultural Lands Preservation Foundation. To establish a baseline, parcels are then selected under a fixed budget with four different prioritization strategies: benefit-targeting (BT), cost-targeting (CT), benefit-cost targeting (BCRT), and a binary linear programming optimization method (OPT). Next, in order to investigate the potential impact of spatial interdependencies on parcel selection, a distinct "gravity" is calculated for each parcel *i* to every other parcel *j* in a feasible set based on the size of the parcels and the distance amongst them. The gravity values are then scaled by an agglomeration preference parameter (α) to determine the additional spatial synergy benefits for all parcels. Parcels are selected utilizing an algorithm for a quadratic knapsack problem (QKP) and a sensitivity analysis is conducted because the true value of the preference parameter α is unknown.

Results from the county-level model demonstrate that optimal (OPT) and near-optimal (BCRT) parcel prioritizations both produce substantially more net benefits to society than suboptimal strategies (BT and CT) that are commonly utilized by preservation agencies. Furthermore, accounting for additional benefits resulting from spatial interdependence dramatically alters the optimal set of parcels selected. Since the primary land preservation decision is whether to preserve a specific parcel, consideration of systematic elements, such as spatial interdependence, is needed to avoid potentially arriving at suboptimal policy guidance.

---

[1] Johnston, R.J., and J.M. Duke. 2007. "Willingness to Pay for Agricultural Land Preservation and Policy Process Attributes: Does the Method Matter?" *American Journal of Agricultural Economics* 89(4): 1098–1115.

Master's Thesis Award of Merit

Agricultural Best Management Practice Adoption Decisions and Spatial Dependence in Southeastern Pennsylvania Farms and Watersheds

Zachary Kaufman

Pennsylvania State University
Advisor: James Shortle

Agricultural and Resource Economics Review 41/3 (December 2012) 391–395
Copyright 2012 Northeastern Agricultural and Resource Economics Association

The objective of this study is to determine factors influencing the Best Management Practice (BMP) adoption decisions of farmers within 17 counties in Southeastern Pennsylvania. Specifically, the land-based characteristics of adoption are analyzed along with the spatial distribution of BMP adoption. In an attempt to discover patterns in adoption at varying scales, both farm- and watershed-level models are utilized. BMP adoption across farms and watersheds is analyzed utilizing count models. Spatial lag, spatial error, and a general spatial model are utilized to determine whether contagion plays a role in BMP adoption decisions at the farm level. Study results indicate that farm acreage and the presence of a stream are significant contributors to BMP adoption. However, the efficiency of policy targeting could be improved through greater emphasis on adoption near impaired streams and in higher priority watersheds. Despite the presence of spatially correlated errors, results indicate that contagion plays a significant role in BMP adoption. It is hypothesized that neighbor interactions and social networking play a role in creating this spatial dependence.

Master's Thesis Award of Merit

Determinants of Health Care Use Among Rural, Low-Income Mothers and Children: A Simultaneous Systems Approach to Negative Binomial Regression Modeling

Swetha Valluri

University of Massachusetts-Amherst
Advisor: Sheila Mammen

The determinants of health care use among rural, low-income mothers and their children were assessed using a multi-state, longitudinal data set, "Rural Families Speak." The results indicate that rural mothers' decisions regarding health care utilization for themselves and for their child can be best modeled using a simultaneous systems approach to negative binomial regression. Mothers' visits to a health care provider increased with higher self-assessed depression scores, increased number of child's doctor visits, greater numbers of total children in the household, greater numbers of chronic conditions, need for prenatal or post-partum care, development of a new medical condition, and having health insurance (Medicaid/equivalent and HMO/private). Child's visits to a health care provider, on the other hand, increased with greater numbers of chronic conditions, development of a new medical condition, and increased mothers' visits to a doctor. Child's utilization of pediatric health care services decreased with higher levels of maternal depression, greater numbers of total children in the household, if the mother had HMO/private health care coverage, if the mother was pregnant, and if the mother was Latina/African American. Mother's use of health care services decreased with her age, increased number of child's chronic conditions, income as a percentage of the federal poverty line, and if child had HMO/private health care insurance. The study expands the econometric techniques available for assessing maternal and pediatric health care use and the results contribute to an understanding of how rural, low-income mothers choose the level of health care services use for themselves and for their child. Additionally, the results would assist in formulating policies to reorient the type of health care services provided to this vulnerable population.

Distinguished Member Award

This award recognizes members who have made continuous and outstanding contributions to the Association, the region, and the profession. The award recognizes members for significant recent professional achievement in the context of an overall meritorious record. Recipients must be members in good standing and be nominated by three other members. A recipient can receive the award more than once, based on recent achievements.

C.S. Kim

C.S. Kim is a Senior Economist at the Economic Research Service of the U.S. Department of Agriculture (ERS/USDA). He received his Ph.D. in Production Economics from Oregon State University. He received his M.S. in Statistics, with a minor in Operations Research, from Utah State University. His background and training have shaped a very unique and specialized research agenda that is valuable to both academics and policymakers. His research interests include theoretical modeling of natural resource and agricultural policy issues, especially those pertaining to groundwater use and groundwater quality.

Dr. Kim has published over 40 articles in 15 journals including *Agricultural and Resource Economics Review*, *Journal of Environmental Economics and Management*, *Risk Analysis*, *Environmental and Resource Economics*, *Water Resources Research*, *Natural Resource Modeling*, *Energy and Environment*, and *Applied Mathematics*. In addition to these are several book chapters, technical bulletins, and over 500 tables of U.S. crop production systems for USDA.

As further evidence of his important scholarly contributions, Dr. Kim has received numerous awards for his research. He received Best Journal Article of the Year from *Risk Analysis* in 2010 and from *Agricultural and Resource Economics Review* in 2006. His work has been invaluable for instruction as well. His article "A Dynamic Model of Adaptations to Resource Depletion: Theory and an Application to Groundwater Mining," published in the *Journal of Environmental Economics and Management* in 1989, was recognized for a USDA Special Merit Award for developing an improved methodology for dynamic adaptation of depletable resource management, and is currently being used as a reference for graduate-level resource economic courses in many major universities.

More recently, Dr. Kim has worked on other areas such as invasive species management, U.S. farm structural changes, industrial structural change, international trade, carbon sequestration, and biofuel economics. He continues to be very active in NAREA events and provides an inspiration for everyone for his wide variety of research interests and continuous significant contributions to both scholarly research and agricultural policy. C.S. Kim is a very valuable member of NAREA and one we would like to recognize as a Distinguished Member for 2012.

NAREA Award for Outstanding Public Service Through Economics

This award was created to recognize and encourage contributions to the general public welfare. The intent is to recognize that agricultural, environmental, consumer, resource, or community development economics can be applied to solve important problems affecting the quality of life of the general public, and that such contributions may come outside the traditional, sometimes narrowly defined, contributions to research, teaching, or extension. The award may be given to anyone, including noneconomists and nonmembers of NAREA.

Katherine R. Smith

Dr. Katherine (Kitty) Smith is Vice President for Programs and Chief Economist for American Farmland Trust, a national NGO dedicated to saving farmland, promoting environmentally sound practices, and keeping farmers on the land. Before joining the Trust in 2011, Dr. Smith functioned in a variety of capacities for thirty years at the U.S. Department of Agriculture's Economic Research Service (ERS), beginning as a research economist and, in 2007, being named its Administrator. Along the way, she served as Associate Director of its Resources and Technology Division, and Director of its Market and Trade Economics Division and its Resource Economics Division.

Dr. Smith, who received a Ph.D. in Agricultural and Resource Economics and a B.S. in the biological sciences from the University of Maryland, has served the agricultural economics profession and the greater public in many important ways. During her long career at ERS, she worked both from inside the public sector and in nonprofit advocacy positions, championing important policy research and using that research to inform public policy decisions. She helped ERS move into many innovative areas. For example, in 2010, she helped push ERS into studying how behavioral economics can improve food and nutrition programs. She also spearheaded efforts in carbon market designs, food security projects, organic farming and marketing, and many other policy areas. Her principal areas of expertise have been policy analysis—particularly agricultural and resource policies—and the relationships among agricultural production and environmental quality. Her work from this period is published in several books and a range of scholarly journals, USDA reports, and numerous other popular outlets.

This résumé of Dr. Smith's career includes a period with the National Center for Food and Agricultural Policy at Resources for the Future, where she was Senior Fellow from 1989 to 1991. From 1993 to 1996, she was Policy Studies Program Director at the Henry A. Wallace Institute for Alternative Agriculture. During the transition of the Obama Administration, she served as Acting Deputy Undersecretary for USDA's Research, Education and Economics mission area. Her contributions to the profession have garnered her numerous distinctions, including, while as a research administrator at ERS, the Presidential Rank Award for Meritorious Executives, in 2001. In 2008, she was made a Fellow of the Agricultural and Applied Economics Association (formerly the American Agricultural Economics Association).

Through the 2012 Award for Outstanding Public Service Through Economics, NAREA recognizes the many contributions that Dr. Smith has made to the agricultural and resource economics profession. She has mentored and supported countless agricultural and resource economists, and pushed them to pursue innovative and high-impact policy research, prompting a former colleague of hers to observe of Dr. Smith that she is "is very organized, thoughtful, and above all else—supportive. She also has an uncanny ability to identify important issues and topics before most other people." Dr. Smith's distinguished leadership and guidance at the Economic Research Service, and her many contributions through other capacities in a long and influential career, have earned the distinction that this award confers in our profession.

Journal Article of the Year for 2011

Open Space and Urban Sprawl: The Effects of Zoning and Forest Conservation Regulations in Maryland

(*ARER* Vol. 40, No. 3, December 2011: 393–404)

Erik Lichtenberg

Rapid urbanization enhances the desirability of policies for preserving open space but policies intended to preserve open space may extend the urban boundary and create leapfrog development. We investigate this potential conflict between open space preservation and urban sprawl conceptually and empirically using data from the Baltimore-Washington suburbs. In accord with previous theoretical and empirical results, the estimated econometric model indicates that both zoning and forest planting requirements contribute to sprawl by increasing the amount of land needed to accommodate the current number of households. These results point to a conflict between preserving open space incorporated into private building lots or internal to subdivisions and public open space at the urban fringe.

ARER Reviewers

September 2011–August 2012

Antonio Alvarez
Henry An
Amy Ando
Titus Awokuse
Gregory Baker
Dana Bauer
Kathleen Bell
Marc Bellemare
John Bernard
Allison Borchers
Rachel Bouvier
James Boyd
Wade Brorsen
Hoy Carman
Richard Carson
Patricia Champ
Hung-Hao Chang
Ariaster Chimeli
Chanjin Chung
David Conner
Harry de Gorter
Sahan Dissanayake
Dusan Drabik
Joshua Duke
Steven Dundas
Allen Featherstone
Jorge Fernandez-Cornejo
Jacob Fooks
Miguel I. Gomez
Gregory Graff
Mads Greaker
Carola Grebitus
Getu Hailu
John Halstead
Andrew Hanks
Nathaniel Higgins
Gal Hochman
Jennifer Ifft
Yanhong Jin
Robert Johnston
Roman Keeney
Jeffrey Kline
Tom Kompas
Laszlo Konya
Jaclyn Kropp
Lynne Lewis
Tingting Liu
Zhuo Liu
Michael Livingston
Jordan Louviere
Shan Ma
Lisa Mancino
Mark R. Manfredo
Stephen Martinez
Jean-Francois Maystadt
Mario Mazzocchi
Kent Messer
Rebecca Moore
Christine Moser
Rebecca Nemec
Markku Ollikainen
Daniel Osgood
George Parsons
Richard Patterson
Douglas Patton
Krishna Paudel
Collin Payne
Gregory Poe
Maksym Polyakov
Kwamena Quagrainie
Octavio Ramirez
Silvio Rendon
Francisco Requena
Marc Ribaudo
Michael Roberts
Matthew Rousu
James Rude
Victoria Salin
Uwe Schneider
Ted Schroeder
Kathleen Segerson
Guanming Shi
Jay Shimshack
James Shortle
Jordan Suter
Loren Tauer
Jennifer A. Thacher
Michael Thomsen
Bo Jellesmark Thorsen
David Timmons
Emi Uchida
Lisa Wainger
William Wheeler
Norbert Wilson
Ferdinand Wirth
Tian Xia

Copyright 2012 Northeastern Agricultural and Resource Economics Association

ARER GUIDELINES FOR MANUSCRIPT SUBMISSION

SUBMISSION

Manuscripts must be submitted electronically. To upload a manuscript, cover letter, and other files or supporting documentation, please go to https://gemini.econ.umd.edu/cgi-bin/e-editor/e-submit_v6.cgi?dbase=arer (or visit ARER's website at http://www.narea.org/journal). This information will be transmitted securely and anonymity will be maintained as your submission is transmitted to referees. Submissions must be uploaded in *PDF format only*. Questions may be addressed to the editor, at messer@udel.edu, or at the following address:

Dr. Kent D. Messer, ARER Editor
Department of Applied Economics and Statistics
531 South College Ave., #226
University of Delaware
Newark, DE 19716 USA

COVER LETTER

The cover letter should indicate that the material is original work, is not being offered for publication elsewhere, is not published elsewhere, and, so far as the author(s) knows, does not infringe upon other published material protected by copyright.

TITLE PAGE and ABSTRACT

On the first page, list the title of the paper, an abstract not to exceed 100 words, and up to eight key words or short phrases (in alphabetical order) describing the content of the manuscript. Funding attribution statements should be placed here.

TEXT PREPARATION

Final manuscripts should be in Microsoft Word (version 2010 or older). The manuscript should be on 8½" × 11" paper. All material, including references and footnotes, should be double-spaced, with 1" margins. Use 12-point Times New Roman type. Use Microsoft Word's footnote feature to number footnotes consecutively throughout the manuscript, using superscript numbers. Do not number headings and subheadings and avoid third-level headings.

STYLE

Refer to the most recent copy of the *ARER* for basic style and format.

TABLES and FIGURES/GRAPHICS

Each table should be placed on a separate page. Use the table feature of Microsoft Word rather than creating tables with tabs. Table titles should be short and descriptive. Do not use color in figures and graphs, as it will not be reproduced in the printed copy. For figures, please use Arial for the font. Do not include figure captions in the graphic itself. After a manuscript has been accepted, the corresponding author will consult with the technical editor in preparing an acceptable electronic version of the figure or graphic.

PERMISSIONS

Authors are responsible for obtaining the necessary permissions to quote or reproduce material, including figures, from already published works and/or any copyrighted material. Please supply an appropriate line of credit where necessary. Personal communication citations are not encouraged, and author(s) using them should have a letter sent to the editors from the source acknowledging agreement with the text.

MATHEMATICAL NOTATION

All mathematical notation must be provided in Times New Roman font. Use only essential mathematical notation. Avoid using the same character for both superscripts and subscripts, using capital letters as superscripts and subscripts, and using overbars, tildes, carets, and other modifications of standard type. Use Microsoft Word's character formatting for bold (vectors and matrices), italics (variables), and superscript and subscript styles. Do not italicize numbers or Greek letters.

REFERENCES

List references alphabetically and unnumbered at the end of the manuscript with the heading "References." List only those actually cited. Cite references in the text by the name(s) of the author(s) and the year of publication, using 1999a and 1999b, for example, if there is more than one source by the same author(s) in a given year. A style sheet on references and citations is available from the editor. Provide volume *and* issue number for journal articles.

PAGE CHARGE

A page charge of $75 per printed journal page is billed to the corresponding author's department, agency, or institution after the article is accepted for publication.